ADDENDUM B **MAY 10, 2006**

SKAGIT
DRAINAGE AND FISH INITIATIVE

DRAINAGE MAINTENANCE PLAN

By and between

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
and
SKAGIT COUNTY
DRAINAGE AND IRRIGATION IMPROVEMENT DISTRICT #14

A. DISTRICT OVERVIEW

A1. Location

Skagit County Drainage and Irrigation Improvement District #14, hereafter referred to as DID #14 is located within the Skagit River and Samish River deltas of Skagit County, north of the Skagit River and south of the Samish River. DID #14 is located north and east of Sedro Wolley and north of Burlington. DID #14 is bisected by Interstate Highway 5 in a north-south direction (Figure 1).

A2. Boundaries

The jurisdictional boundaries of DID #14 are illustrated in Figure 2. DID #14 is approximately bordered by Farm To Market Road to the west, Bayview Ridge to the southwest, approximately Truman Loop Road, Allen West Road, Bradley Road, Cook Road, Kelleher Road to the north, F&S Grade Road to the northeast, Town of Sedro Wolley, Sterling Hill and Town of Burlington to the southeast, and Peterson Road to the south.

A3. Area

DID #14 encompasses 9259 acres within its jurisdictional boundaries (Figure 2).

A4. Predominant Land Uses

Commercial agriculture is the predominant land use in DDD #14. Hobby farms, residential housing, and a few commercial businesses are scattered within the districts boundaries.

A5. Watercourse Classifications

The watercourse classifications used in this drainage management plan are defined in Part III-(A) of the appurtenant Drainage Maintenance Agreement. An 1887 U.S. Coast and Geodetic Survey Map (Figure 3) was used to determine the extent of the *Natural Watercourses* (blue), *Managed Watercourses With Headwaters* (green), *Managed Watercourses Without Headwaters* (magenta), and *Artificial Watercourses* (yellow) in DID #14. DID #14 includes three historic watercourses of significance, Joe Leary Slough, Thomas Creek and Wollard Creek. Thomas Creek and Wollard Creek have been classified as Managed Watercourses With Headwaters (green) whereas Joe Leary Slough has been classified as a Managed Watercourse Without Headwaters (magenta). Figure 2 illustrates the watercourse classifications in DID #14. It is important to note that Joe Leary Slough, Thomas Creek and Wollard Creek do not exactly conform to the watercourse classification definitions as defined in Part III (A) of the Drainage Maintenance Agreement and are therefore discussed here in more detail:

Joe Leary Slough:

Joe Leary Slough is a tributary to Padilla Bay. Though Joe Leary Slough has been classified as a *Managed Watercourse Without Headwaters* (magenta), it is important to note that it does not strictly conform to the definition of a *Managed Watercourse Without Headwaters* as specified in Part III (A) of the Drainage Maintenance Agreement. Unlike other watercourses in Skagit County that have been classified as a *Managed Watercourse Without Headwaters* (Wiley Slough, Dry Slough, Brown Slough, Hall Slough, Dodge Slough, Sullivan Slough), Joe Leary Slough includes two small higher gradient tributary watercourses that drain the northeast corner of Bayview Ridge. However, though this higher gradient headwater area is consistent with the criteria that defines a *Managed Watercourse With Headwaters* (green), for the purpose of the Drainage Maintenance Plan for DID #14, Joe Leary Slough has been classified as a *Managed Watercourse Without Headwaters* for the following reasons:

a. The steeper gradient headwater area is small.

b. The available spawning habitat associated with the steeper headwater area is limited.

c. The upstream passage of adult and juvenile fish into Joe Leary Slough through the districts tidegate site #41 is restricted to very narrow windows of the tide cycles during which the tidegate is open and the discharge velocity does not exceed the upstream swimming capabilities of the individual fish.

d. The upstream distribution for fish immigrating into Joe Leary Slough upstream of the districts tidegate site #41 is very limited by water quality.

e. Cutthroat trout are the only cold water fish that have been observed in the headwater area. It is presumed that the cutthroat trout in the headwater area are a resident population due

to the restricted passage at the district's tidegate site #41 and the poor water quality in Joe Leary Slough upstream of the district's tidegate site #41.

Thomas Creek and Wollard Creek:
Wollard Creek is a tributary to Thomas Creek. Thomas Creek is a tributary to the Samish River. Though Thomas Creek and Wollard Creek have been classified as *Managed Watercourses With Headwaters* (green), it is important to note that they do not strictly conform to the definition of a *Natural Watercourse* or of a *Managed Watercourses With Headwaters* as specified in Part III (A) of the Drainage Maintenance Agreement. Unlike the other watercourses in Skagit County that have been classified as *Natural Watercourses* (Skagit River, Samish River), Thomas Creek and Wollard Creek do not discharge directly to marine waters. Thomas Creek discharges to the Samish River and Wollard Creek discharges to Thomas Creek. Unlike the other watercourses in Skagit County that have been classified as *Managed Watercourses With Headwaters* (Big Ditch, No Name Slough, Big Indian Slough), Thomas Creek and Wollard Creek do have flow control structures at their confluences. In addition, the bank full width and watershed area of Thomas Creek and Wollard Creek more closely approximates the other watercourse in Skagit County that have been classified as *Managed Watercourses With Headwater*. Therefore, for the purpose of the Drainage Maintenance Plan for DID #14, Thomas Creek and Wollard Creek are classified as *Managed Watercourses With Headwaters* (green).

In total, DID #14 includes approximately 33.21 miles of watercourses covered by this agreement. These include the following classifications:

a) Artificial Watercourses (yellow): 102,347 feet, 19.38 miles.
b) Managed Watercourses Without Headwaters (magenta): 56,402 feet, 10.68 miles.
c) Managed Watercourse With Headwaters (green): 16,614 feet, 3.15 miles.
d) Natural Watercourses (blue): 0 feet, 0 miles.

A6. Drainage Infrastructure

The drainage infrastructure for DID #14 includes 43 culvert sites, 1 tidegate site, and associated trash racks (Figure 2) (Table 1and Table 2). The drainage from DID #14 via Thomas Creek is discharged into the Samish River and ultimately into Samish Bay though conventional gravity flow drainage infrastructure. The drainage from DID #14 via Joe Leary Slough is discharged into Padilla Bay through conventional gravity flow drainage infrastructure. The culvert/tidegate infrastructure at tidegate site #43 are equipped with top hinged "flap style" lids. The drainage infrastructure for DID #14 does not include a pump station.

A6-1. Flood Management

In an average year, the Samish River, Thomas Creek and Wollard Creek can overtop their banks between November and February. Figure 3a illustrates the flood flow pathways of an average year flood event in DID#14.

Wollard Creek: During a flood flow event, discharge from Wollard Creek into Thomas Creek is restricted by the high flows in Thomas Creek. Consequently, Wollard Creek can overtop its left bank along the F&S Grade Road as illustrated in Figure 3a. Flood flows from Wollard Creek inundate the farmland south and west of the F&S Grade Road. Flood flows from Wollard Creek do not return to Thomas Creek, Wollard Creek, Samish River or Skagit River but infiltrates into the underlying aquifer.

Thomas Creek: During a flood flow event, discharge from Thomas Creek is restricted by the high flows in the Samish River. Consequently, Thomas Creek can overtop its left bank between Old Highway 99 and the Samish River as illustrated in Figure 3a. Flood flows from Thomas Creek inundate the farmland south of the creek and west of Old Highway 99. Flood flows from Thomas Creek return to the Samish River.

Samish River: During a flood flow event, discharge from the Samish River can affect flood flow discharge in Thomas Creek as noted above. Flood flows in the Samish River can overtop its left bank at two locations as illustrated in Figure 3a. Flood flows in the Samish River that overtop its bank at the north site inundate the farmland north of Thomas Creek and west of Old Highway 99. Flood flows in the Samish River that overtop its bank at the south site flows to the east inundating the farmland beyond Green Road as illustrated in Figure 3a. Flood flows from the Samish River return to the Samish River.

TABLE 1. CULVERT INVENTORY – DID #14

Culvert Number	Culvert Shape	Culvert Material	Culvert Coating	Culvert Span/Dia (M)	Culvert Rise	Culvert Length (M)	Stream Name
584	OTH	CPC	NON	25	5	9.5	Joe Leary Slough
585	SQSH	CST	GAL	5	1.5	8	Joe Leary Slough
586	OTH	CPC	NON	22	4	9.1	Joe Leary Slough
587	ARCH	CST	GAL			12	Joe Leary Slough
603	BOX	PCC	NON	1.52	1.22	0	Joe Leary Slough
622	OTH						Joe Leary Slough
623	OTH			13	4	0.5	Joe Leary Slough
624	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
625	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
626	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
627	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
628	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
629	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
630	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
631	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
632	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
633	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
634	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough

635	RND	CST	GAL	1.2	1.2	13	Joe Leary Slough
636	OTH	WOOD	unknown	5	3	6	Joe Leary Slough
637	OTH	WOOD	unknown	5	3	6	Joe Leary Slough
638	ARCH	CST	unknown	4	2.5	8	Joe Leary Slough
639	OTH	WOOD	unknown	7	3	5	Joe Leary Slough
640	OTH	STEEL	PNT	10	3	4	Joe Leary Slough
641	OTH	WOOD	UNK	10	4	5	Joe Leary Slough
642	ARCH	CST	GAL	5	3	16	Joe Leary Slough
643	ARCH	CST	unknown	4	2.5	8	Joe Leary Slough
644	OTH	CPC	unknown	12	2	8	Joe Leary Slough
645	OTH	CPC	unknown	20	3		Joe Leary Slough
646	OTH	CPC	unknown	20	3		Joe Leary Slough
647	OTH	CPC	unknown	13	2	8	Joe Leary Slough
603	BOX	PCC	NON	1.52	1.22	0	Joe Leary Slough
879	OTH	CPC		15.50	3.10	9.50	Thomas Cr
880	OTH	CPC		14.50	3.40	8.00	Thomas Cr
886	RND	PCC	NON	0.91	0.91	11.00	Thomas Cr
887	SQSH	SPS		3.00	2.00	14.10	Thomas Cr
889	RND	CST	GAL	2.44	2.44	22.70	Thomas Cr
890	RND	PCC	NON	1.53	1.53	19.80	Thomas Cr
891	RND	CST	GAL	2.44	2.44	29.00	Thomas Cr
974	RND	PCC		1.53	1.53	37.00	Wollard Cr
975	RND	PCC		0.91	0.91	13.70	Wollard Cr
976	BOX	CPC		1.25	1.70	5.50	Wollard Cr
981	OTH	CPC					Wollard Cr
01	Floodgate						Thomas Cr
02	Floodgate						Thomas Cr
03	Floodgate						Thomas Cr

TABLE 2. TIDE GATE AND PUMP FACILITY INVENTORY – DID #14

Number	Type	Location	Description
43	Tidegate	Joe Leary Slough	12-48” Tidegates

A7. Drainage Maintenance Activities – General Description

A7-1. Trash Racks

Trash racks are systems designed to prevent foreign material from entering into a pump facility or tide gate. Foreign material is defined as any man made or natural material that could be carried by water and become lodged in the system or accumulate and cause flow disruption or prevent a pump or tide gate from functioning properly. Normal maintenance of trash racks includes removal of accumulated debris as necessary, replacement of worn or damaged trash rack components or replacement of the structure. Typical design of a trash rack includes a constructed lumber unit with vertically spaced 2-inch dimensional boards spaced approximately 3-5 inches apart. The unit is usually set in the water at an incline down to or near the bottom of the drainage ditch. The incline allows for cleaning debris by raking it to the top and removing it from the ditch.

A7-2. Pump Facilities
Pump facilities are typically electric pump installations. Pumps are mounted on permanent structures with a suction pipe extending into the drainage ditch. Pumps are typically set to function on a remotely activated basis dependant upon water level in the ditch. Typical maintenance includes routine mechanical servicing of a pump and its electrical connections, as well as removal of any accumulated debris that may prevent or interfere with normal operation.

A7-3. Culverts
Culverts must be maintained to ensure normal flow passes through the culvert consistent with its design specifications. This typically includes dredging of a ditch adjacent to culvert openings and occasional cleaning-out of the culvert interior. Cleaning is usually performed through the use of high-pressure water, mechanical dredging or by hand. Repair or replacement is necessary when incidental damage occurs to the culvert that would prevent optimum water flow or an unsafe crossing situation.

A7-4. Flood Gates
Floodgates are one-way check valves that allow accumulated water to flow from a field into a drainage system during and after a high water event. The maintenance of such structures is the same as for tide gates and must include debris removal in order to allow the structure to function properly. Necessary repair and replacement must be performed as needed.

A7-5. Tide Gates
Tide gates are one-way check valves located at the end of a drainage system to allow water to flow outward from within the system to salt water areas during a low tide cycle and then close to prevent saltwater from entering the drainage system when the tide rises. Work on tide gates usually includes removal of any lodged debris that may prevent the gate from closing or operating properly. Other normal maintenance would be completed as needed to insure the gate operates normally. Replacement of tide gates is not covered by this agreement and would be addressed by application for and issuance of a separate HPA.

A7-6. Channel In-Water Bucket Mowing
Channel in-water bucket mowing is a technique that employs a hydraulically operated sickle bar mower mounted on the front edge of a dredging bucket. The machine mows vegetative material below the water line, with the mowed material accumulated in the bucket. The material is then deposited on the ground away from the ditch. This type of mowing provides removal of vegetative material but does not remove vegetative root systems or soil.

A7-7. Channel Out-of-Water Mowing
Channel out-of-water mowing involves the routine removal of vegetative material above the water line to the top of the bank. It is completed using various types of mechanical mowers (rotary or flail designs) and reduces vegetative material during normal growing periods.

A7-8. Dredging

Dredging is completed, as needed, by utilizing a hydraulically operated boom-type excavator. The excavator has a wide, flat-bottomed bucket that scrapes down one side of a watercourse, rounds out the bottom and comes up the opposite side in one continuous motion. Thus the result leaves the ditch with inclined sides and a round bottom feature that minimizes side sloughing and erosion into the bottom of a ditch. All dredged material is deposited landward of the ditch so that it will not return to the water and can later be moved back into the adjoining field or be hauled away when and where necessary. When work is completed in ditches that are too large for a boom-type excavator, a dragline-type excavator is utilized. The process is typically the same, except that a dragline excavator works from the middle of the ditch to one side and then works the opposite side in a separate similar manner.

A7-9. Bridges

Bridges must be properly maintained in order to ensure normal flow under the bridge while also continuing to provide equipment or foot access across a watercourse. Repair or replacement is necessary when incidental damage occurs to a bridge that prevents optimum water flow or results in an unsafe crossing situation. Repair or replacement activities typically occur above the high water line.

A8. General Fish and Fish Habitat Information

For the purpose of this Drainage Maintenance Plan, the term “fish” includes all species of native cold-water fishes. However, particular emphasis is placed on salmonid species that are managed by WDFW as commercially and recreationally important fisheries. These include Pink salmon, Chum salmon, Sockeye salmon, Coho salmon, Chinook salmon, Rainbow trout (including Steelhead), Cutthroat trout, and native Char. Pink salmon, Chum salmon, Sockeye salmon, Coho salmon, and Chinook salmon are Anadromous, in that they return to freshwater habitats to spawn after spending the majority of their lives in salt-water environments. Rainbow trout, Cutthroat trout, and native Char can either be freshwater resident or anadromous.

A8-1. Fish Passage

Fish passage to and from the district waterways is restricted by several features within the drainage infrastructure. A dike system protecting the district from flood and tidal flows generally blocks the passage of adult and juvenile fish. In those cases where waterways intersect the levee system, passage is restricted by a culvert fitted with some sort of tide regulating mechanism or is blocked entirely by the dike system. Either of these features strictly limits the access of fish to and from the system except in those instances where floodwaters top or breach the system. In some cases, waterways that intersect the dike system are fitted with pump stations that facilitate the export of water over and through the dike. These pump stations are often used as backup mechanisms to conventional gravity discharge so that heavy storm related flows can be managed more effectively. Adult and juvenile fish can be entrained into the pumps during their downstream migration where they can be injured or killed. The majority of drainage pump

facilities are associated with culvert/tide gate complexes through which upstream and downstream passage of adult and juvenile fish is possible, though limited.

The primary point of access for fish to and from the system is located at those intersections where the gravity flow drainage is managed by a culvert fitted with some sort of tide regulating feature. Though tide gates do not completely block the upstream passage of adult and juvenile fish, upstream passage is restricted to very narrow windows of the tide cycles during which the tide gate is open and the discharge velocity does not exceed the upstream swimming capabilities of the individual fish. The window for upstream passage is greater for adult fish than for juvenile fish because of their stronger swimming capabilities. Tide gates do not completely block the downstream passage of adult and juvenile fish though downstream passage is limited to the low tide cycles when the water surface elevation upstream of the tide gate is sufficiently greater than the water surface elevation downstream of the tide gate to create the head differential to open the tide gate.

A8-2. Fish Habitat Distribution

Managed Watercourses With Headwaters (green) typically include suitable spawning, rearing and migration habitats for Coho salmon and Cutthroat trout. Spawning habitats typically occur in those reaches that have gradients between 1-3% and are fed by flowing water and a steady supply of suitable sediments. These reaches tend to be found at the junction between low gradient tidally influenced reaches and the steeper gradient headwater reaches of the system.

Rearing habitats can be distributed throughout these watercourses but are primarily located where there is sufficient channel complexity, riparian canopy, water quality and invertebrate productivity (fish prey/forage). Though upstream and downstream fish migration typically occurs throughout these watercourses, both natural and manmade barriers can and do restrict or block fish passage.

Managed Watercourses Without Headwaters (magenta) can provide suitable rearing habitat immediately upstream of the terminal culvert/tide gates for a variety of fish species that immigrate into the watercourse from the estuary to forage on available prey. The accessibility of this rearing habitat to fish depends on the type of tide gate present and the degree to which it allows upstream fish passage and the exchange of key habitat forming processes, such as hydrology and sediment. The suitability of this habitat for rearing depends largely on water quality and prey/forage production factors which in part is governed by the interaction of hydrology, sediment, woody debris, riparian processes and other natural forces. Spawning habitat is typically not present in this watercourse type.

Artificial Watercourses (yellow) are wholly manmade systems constructed to convey water from a local surface or subsurface area for the purpose of improving the soil conditions for agriculture. Typically these watercourses are seasonal and do not have the habitat characteristics or natural

processes necessary to support the rearing and spawning requirements of native cold water fishes.

A8-3. Fish Distribution - General

Fish survey data is primarily available for only the headwater reaches of the *Managed Watercourses With Headwaters* (green) within the drainage districts. Very limited fish survey data is available for the lowland reaches of the *Managed Watercourses With Headwaters* (green) and for *Managed Watercourses Without Headwaters* (magenta). Fish survey data has not been collected for *Artificial Watercourses* (yellow).

Managed Watercourses With Headwaters (green) typically support reproducing populations of Coho salmon and Cutthroat trout. The reproducing populations of Cutthroat trout can be either anadromous or resident. Anadromous adult Coho and Cutthroat typically enter the lower reaches of the watercourse to begin their upstream migration to the spawning habitats in late fall. Spawning occurs in the upper reaches of the watercourse where suitable spawning substrate is present and accessible. Coho spawn in the late fall and Cutthroat spawn in early spring. Coho adults die after spawning whereas Cutthroat can survive to spawn in successive years. Anadromous adult Cutthroat that survive spawning out migrate the watercourse from mid to late spring. After hatching from gravel nests (redds), emerging juvenile Coho and Cutthroat will distribute themselves to suitable rearing habitats in the watercourse. Anadromous juvenile Coho and Cutthroat generally spend 22 to 18 months rearing in freshwater before migrating to the marine environment. Generally, juvenile anadromous Coho and Cutthroat are present in the accessible reaches of the watercourse throughout the year. Resident adult and juvenile Cutthroat are typically present in the upper reaches of the watercourses throughout the year.

In addition to fish originating from this watercourse type, it is generally assumed that between February and July, fish from other watercourses may immigrate from the estuary into the lower reaches of the watercourse via the culvert/tide gates to forage on available prey. It is generally assumed that the upstream distribution and duration of residence for these immigrating fish is limited by water quality, prey availability and their physiological affinity for salt water. In addition to salmonid species, forage fish species such as surf smelt and sand lance also use the estuary habitats for rearing and could potentially immigrate into the lower reaches of the watercourse. Adult native char and cutthroat could also be expected to immigrate into the lower reaches of the watercourse in pursuit of juvenile salmon and forage fish species. Generally elevated water temperatures found in these low land systems have also led to colonization by exotic species of fish that prefer warm water habitats. Surveys have identified Pumpkinseed, Crappie, and Smallmouth Bass, among others, as being year around residents in the lower reaches of these systems. Many of these warm water species are voracious predators and could be considered deleterious to salmonid productivity.

Managed Watercourses Without Headwaters (magenta) generally do not support resident populations of cold-water game fish. This is largely attributed to the presence of drainage infrastructure that limits the exchange of tidal hydrology and/or connection to riverine hydrology. It is generally assumed that between January and July, fish from other watercourses may immigrate from the estuary into the lower reaches of this watercourse type via the culvert/tide gates to forage on available prey. It is generally assumed that the upstream distribution and duration of residence for these immigrating fish is limited by water quality, prey availability and their physiological affinity for salt water.

Artificial Watercourses (yellow) are manmade and designed to convey water from local surface and subsurface areas in order to improve the soil conditions for agriculture. These watercourses are typically dry in the summer. Water quality and quantity can negatively affect the suitability of the potential rearing habitat. The habitat characteristics and natural processes required by native cold water fish for rearing and spawning are not supported by these artificial watercourses. It is therefore assumed that the presence of native cold water fish is either very limited or absent in this watercourse type.

A8-4. Fish Survey Data - DID #14

Fish survey data has not been collected for the watercourses within the jurisdictional boundaries of DID #14. However, fish survey data has been collected for the headwater tributaries of Thomas Creek, Wollard Creek and Joe Leary Slough. Fish survey data collected in the headwater tributaries of Thomas Creek and Wollard Creek indicate that Chinook salmon, Coho salmon, chum salmon, steelhead trout and cutthroat trout are present. Fish survey data collected in the headwaters of Joe Leary Slough indicated that cutthroat trout are present (Figure 4 and Figure 4a, Table 4 and Table 5).

Table 4. DID #14 – Thomas Creek and Wollard Creek Fish Survey Data

Data No.	Watercourse	Fish Species	Observer	Observations
21	Un named	Coho, Cutthroat	JJ	Depressed
22	Un named	Coho	DH, KB	Healthy
23	Un named	Coho, Cutthroat	SGSDB, DH	Depressed
24	Thomas Creek	Chinook, Chum	SGSDB, DH	Healthy
25	Un named	Coho, Cutthroat	JJ	Depressed
26	Thomas Creek	Chum	DH	Depressed
27	Thomas Creek	Coho	DH, KB	Healthy
28	Un named	Coho, Cutthroat	JJ	Depressed
29	Un named	Coho	DH, KB	Healthy
30	Un named	Cutthroat	DH, KB	Healthy
31	Un named	Cutthroat	DH	Healthy
32	Thomas Creek	Cutthroat	DH	Healthy
33	Un named	Cutthroat	DH	Healthy
34	Wollard Creek	Coho, Cutthroat, Chum	BB	Healthy
35	Un named	Coho, Cutthroat	BB	Healthy

36	Un named	Coho, Cutthroat	JJ	Depressed
37	Un named	Coho	KB	Healthy
38	Un named	Coho, Cutthroat	MO	Depressed
39	Un named	Coho, Cutthroat	MO	Depressed
40	Un named	Coho, Cutthroat	MO	Depressed
41	Un named	Coho	KB	Healthy
42	Un named	Coho, Cutthroat, Rainbow	MO	Depressed
43	Un named	Coho, Cutthroat	MO	Depressed

Table 5. DID #14 – Joe Leary Slough - Fish Survey Data

Data No.	Watercourse	Fish Species	Observer	Observations
44	Un named	Cutthroat	DH, KB	Critical
45	Un named	Cutthroat	DH, KB	Critical

A8-5. Fish Distribution - DID #14

Given the significant difference in fish presence and use between a *Managed Watercourses With Headwaters* (Thomas Creek, Wollard Creek) and a *Managed Watercourse Without Headwaters* (Joe Leary Slough), fish presence and use in Joe Leary Slough will be discussed separately from fish presence and use in Thomas Creek and Wollard Creek.

Joe Leary Slough

Fish data has not been collected for the watercourses within the jurisdictional boundaries of DID #14. However, as noted above in Section A5, the watershed for Joe Leary Slough includes two small tributary watercourses that drain a small higher gradient headwater area at the northeast end of Bayview Ridge. Fish data for these two small tributary watercourses indicate that cutthroat trout are present in each (Table 4, Figure 4a). It is presumed that the observed cutthroat trout are a resident population due to the restricted upstream passage of fish at the district's tidegate site #41 and the poor water quality in Joe Leary Slough upstream of the district's tidegate site #41.

Thomas Creek

Thomas Creek is a tributary to the Samish River. Fish passage between Thomas Creek and the Samish River is not impeded or restricted by a flow control structure. Though fish data has not been collected within the jurisdictional boundaries of DID #14, fish data has been collected for the steeper gradient reaches of Thomas Creek and tributary watercourses to Thomas Creek outside of the jurisdictional boundaries of DID #14. The fish data for Thomas Creek indicates that Chinook salmon, Coho salmon, chum salmon, cutthroat trout and rainbow trout are present (Table 4, Figure 4a). The cutthroat trout could be both resident and anadromous whereas the salmon species are only anadromous. The rainbow trout are presumed to be anadromous.

Wollard Creek

Wollard Creek is a tributary of Thomas creek. Fish data has not been collected within the jurisdictional boundaries of DID #14, fish data has been collected for the steeper gradient reaches of Wollard Creek outside of the jurisdictional boundaries of DID #14. Fish data for Wollard Creek indicates that Chinook salmon, Coho salmon, chum salmon, cutthroat trout and

rainbow trout are present (Table 4, Figure 4a). The cutthroat trout could be both resident and anadromous whereas the salmon species are only anadromous. The rainbow trout are presumed to be anadromous.

Photographs of the drainage infrastructure in DID #14 are presented in Figure 8.

B. MANAGED WATERCOURSE WITH HEADWATERS - CLARIFICATIONS

Joe Leary Slough - *Managed Watercourse Without Headwaters*
Joe Leary Slough is a tributary to Padilla Bay. Though Joe Leary Slough has been classified as a *Managed Watercourse Without Headwaters* (magenta), as noted in Section A5, it does not strictly conform to the definition of a *Managed Watercourse Without Headwaters* as specified in Part III (A) of the Drainage Maintenance Agreement for the following reasons:

a. The steeper gradient headwater area is small.
b. The available spawning habitat associated with the steeper headwater area is limited.
c. The upstream passage of adult and juvenile fish into Joe Leary Slough through the districts tidegate site #41 is restricted to very narrow windows of the tide cycles during which the tidegate is open and the discharge velocity does not exceed the upstream swimming capabilities of the individual fish.
d. The upstream distribution for fish immigrating into Joe Leary Slough upstream of the districts tidegate site #41 is very limited by water quality.
e. Cutthroat trout are the only cold water fish that have been observed in the headwater area. It is presumed that the cutthroat trout in the headwater area are a resident population due to the restricted passage at the district's tidegate site #41 and the poor water quality in Joe Leary Slough upstream of the district's tidegate site #41.

Given the limited presence of fish in Joe Leary Slough, habitat improvement projects (mitigation measures) associated with the maintenance of the district's existing drainage infrastructure in Joe Leary Slough as identified in the Drainage Maintenance Plan are not required. When fish habitat improvements are proposed in Joe Leary Slough, they will be voluntary and contingent upon the participation of a willing landowner. In addition, fish habitat improvements in Joe Leary Slough will maintain flood protection, guard against salt-water intrusion and maintain the drainage capabilities of the district.

Thomas Creek/Wollard Creek - *Managed Watercourses With Headwaters*
Thomas Creek is a tributary to the Samish River. Wollard Creek is a tributary to Thomas Creek. Though Thomas Creek and Wollard Creek have been classified as *Managed Watercourses With Headwaters* (green), as noted in Section A5, they do not strictly conform to the definition of a

Managed Watercourses With Headwaters or of a *Natural Watercourse* as specified in Part III (A) of the Drainage Maintenance Agreement. However, given that they do not discharge directly to a marine water body, that the width of the watercourses and their watershed areas, for the purpose of the Drainage Maintenance Plan for DID #14, Thomas Creek and Wollard Creek are classified as *Managed Watercourses With Headwaters* (green) and are discussed further in Section B1.

B1. Reach Assessments - Thomas Creek/Wollard Creek

The bed elevations of Thomas Creek and Wollard Creek within the jurisdictional boundaries of DID #14 were surveyed in July, 2005 by Azimuth Northwest Inc. (Figure 5). Thomas Creek and Wollard Creek within the jurisdictional boundaries of DID #14 were partitioned into 6 reaches (Figure 6) to facilitate the following detailed reach assessments.

REACH 1

Reach Description - Figure 6
Reach 1 begins at the confluence of Thomas Creek with the Samish River and extends upstream to the bridge at Green Road.

Reach Length
Reach 1 is approximately ? miles in length.

Reach Drainage Infrastructure – Figure 2
The drainage infrastructure in Reach 1 includes the WDOT Old Highway 99 bridge (#879) and Skagit County's Green Road bridge (#880).

Reach Drainage Maintenance Activities
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
The Old Highway 99 bridge is maintained by WDOT as needed.
The Green Road bridge is maintained by Skagit County as needed.
Beaver Dam Removal
Beaver dams are removed as required.

Reach Habitat Conditions
Reach 1 has been straightened, channelized and confined by dikes along both sides. Both the north and south channel banks are very steep. Large woody debris is not present in this reach. Silts and fines dominate the channel substrate. As noted below, the riparian habitat along this reach is limited to blackberries and reed canary grass. Consequently, elevated water temperatures and reduced dissolved oxygen levels, especially during the summer, would be expected to limit the suitability of the habitat for juvenile rearing. Summer rearing conditions may improve as the KREP riparian plantings along the south bank mature and provide greater canopy cover to the creek. Adult and juvenile migration is possible through this reach though it may be restricted at times by shallow water and poor water quality.

Riparian Characteristics
Between Old Highway 99 and the Samish River, the riparian habitat on the right bank (north) is dominated by blackberry and the riparian habitat on the left bank (south) is dominated by reed canary grass. There are a few mature conifers and evergreen trees along the channel in the vicinity of the Samish River confluence. Between Old Highway 99 and Kelleher Road, the riparian habitat on the right bank (north) is dominated by blackberry and the riparian habitat on the left bank (south) is dominated by salmon berry and reed canary grass. Mature conifers and evergreen trees along the channel area absent. Between Kelleher Road and Green Road, the riparian habitat on the right bank (north) adjacent to Kelleher Road is dominated by blackberry, salmon berry and scattered willows. The riparian habitat on the left bank (south) adjacent to the dike is dominated by reed canary grass. Mature conifers and evergreen trees along the channel area absent.

Riparian Habitat Observations Associated With Channel Cross Sections	
Channel Cross Section 2a	**Channel Cross Section 2b**
0 trees	3 trees
1 large shrub	90% Himalayan Blackberry
	10% other riparian shrubs

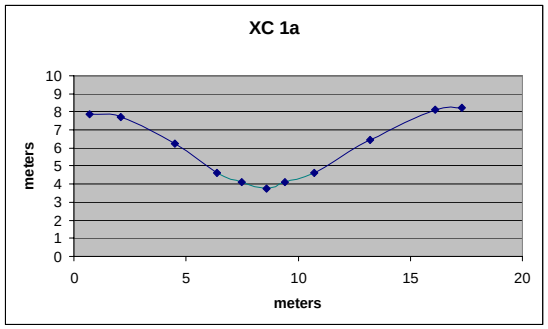
Fish Passage Barriers & Obstacles – Figure 4
According to WDFW's Salmonscape Database, there are no fish passage barriers or obstacles in Reach 1.

Spawning Habitat
Spawning habitat for salmonid species is not present in Reach 1.

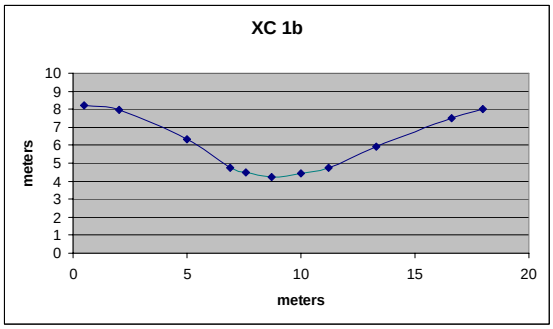
Addendum B
Drainage Maintenance Plan
Drainage and Irrigation District #14

Channel Cross Section

Lower Section



Upper Section



Reach Fish Utilization – Figure 4

Reach 1 is a migratory corridor for adult and juvenile salmon. Juvenile salmon utilize Reach 1 for winter rearing. Juvenile salmon summer rearing in Reach 1 will be limited by low flow conditions and water quality constraints. Summer rearing conditions may improve as the KREP riparian plantings along the south bank mature provide greater canopy cover to the creek.

Reach Fish Habitat Improvement Opportunities – Figure 7

1. Channel Modification: The right bank (north) between Old Highway 99 and the Samish River is very steep. In addition, the dike along the north side of the channel is 45 feet wide. The right bank of the channel could be laid back and benched to provide additional bank stability, flood storage and improved fish habitat. The bench could be planted with salmon berry, hard hack and willow to discourage reed canary grass and shade the channel. Dike top access and the ability to access the channel with equipment for maintenance dredging could be retained.

2. Channel Modification: The left bank (south) between Old Highway 99 and the Samish River is very steep. The right bank of the channel could be laid back and benched to provide additional bank stability, flood storage and improved fish habitat. The bench could be planted with salmon berry, hard hack and willow to discourage reed canary grass and shade the channel. Dike top access and the ability to access the channel with equipment for maintenance dredging could be retained. However, laying the right bank back would displace one row of small conifer trees associated with the a KREP riparian project.

3. A flood overflow swale could be constructed on the Nef Farm to confine the flood flows from Thomas Creek and effectively route the flood flows back to the Samish River. A flood overflow swale could reduce the area of the Nef Farm that is flooded and could reduce the risk of fish stranding in the fields when the flood flows recede. The flood

overflow swale could be configured such that agriculture is maintained within the footprint of the flood overflow swale. DID #14 drainage would also benefit by a flood overflow swale.

Reach Photographs – Figure 8

REACH 2

Reach Description - Figure 6
Reach 2 begins at the Green Road bridge (#880) and extends upstream to approximately opposite Kelleher Road culvert #831.

Reach Length
Reach 2 is approximately ? miles in length.

Reach Drainage Infrastructure – Figure 2
The drainage infrastructure in Reach 2 includes the Skagit County's Green Road bridge. There are supposedly 2 flood gates along the left bank (south side) of Thomas Creek, though they are not identified in Skagit County's culvert inventory.

Reach Drainage Maintenance Activities
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
The Green Road bridge is maintained by Skagit County as needed.
Flood Gate Maintenance
Repair and replace flood gates as required.
Beaver Dam Removal
Beaver dams are removed as required.

Reach Habitat Conditions
The channel in Reach 2 has been modified and simplified via historic dredging and diking activities. The channel is confined by a dike along the left bank (south) and along the right bank (north) by Kelleher Road. Large woody debris is not present in this reach. Silts and fines dominate the channel substrate. As noted below, mature conifer and deciduous trees are absent

from the riparian habitat along this reach. Consequently, elevated water temperatures and reduced dissolved oxygen levels, especially during the summer, would be expected to limit the suitability of the habitat for juvenile rearing. Adult and juvenile migration is possible through this reach though restricted at times by shallow water and poor water quality.

Riparian Characteristics
Between Green Road and approximately Kelleher Road culvert #881, a distance of approximately .75 miles, the riparian habitat on the right bank (north) adjacent to the road is dominated by blackberry, salmon berry, scattered willows and reed canary grass. The riparian habitat on the left bank (south) adjacent to the dike is dominated by reed canary grass.

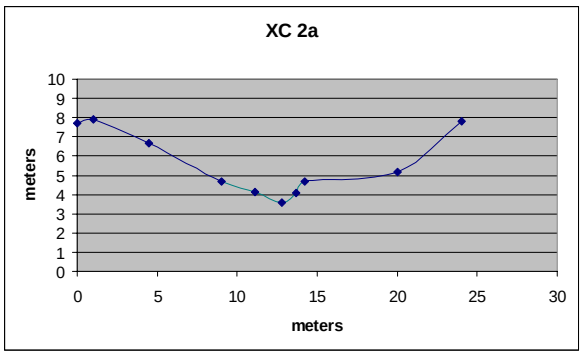
Riparian Habitat Observations Associated With Channel Cross Sections	
Channel Cross Section 2a	**Channel Cross Section 2b**
2 trees	4 trees, adjacent to road, away from wetted area
Reach 2 is dominated by RC grass	Reach 2 is dominated by RC grass

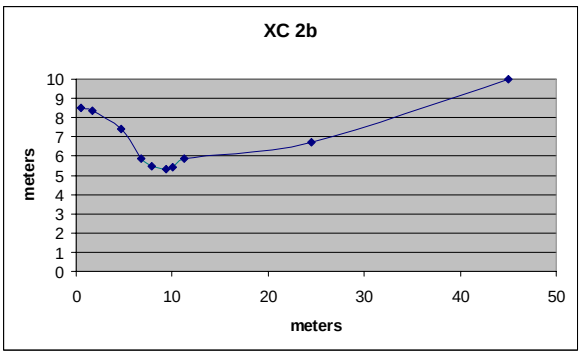
Fish Passage Barriers & Obstacles – Figure 4
According to WDFW's Salmonscape Database, there are no fish passage barriers or obstacles in Reach 2.

Spawning Habitat
Spawning habitat is not present in Reach 2.

Channel Cross Section

Lower Section **Upper Section**





Reach Fish Utilization – Figure 4
Reach 2 is a migratory corridor for adult and juvenile salmon. Juvenile salmon utilize Reach 2 for winter rearing. Juvenile salmon summer rearing in Reach 2 will be limited by low flow conditions and water quality constraints.

R**each Fish Habitat Improvement Opportunities – Figure 7**

1. Wetland and Side Channel Development: Approximately .5 miles upstream of Green Road, there is approximately 5-10 acres of reed canary dominated wetland along the right bank of Thomas Creek. This reed canary dominated wetland could be modified and enhanced to provide side channel rearing habitat, native wetland habitat, water quality benefits and riparian habitat. Maintenance of Thomas Creek could still be accomplished via the dike on the left bank (south side).

2. Wetland Reconnection: The Skagit Land Trust wetland east and adjacent to Green Road could be replumbed to allow fish access. The ponds and channels could be interconnected to provide valuable off channel rearing habitat for juvenile salmonids.

Reach Photographs – Figure 8

REACH 3

Reach Description - Figure 6
Reach 3 begins at culvert #881 upstream of Avalon Road and extends upstream to where Thomas Creek makes a hard turn to the north (downstream of Kelleher Road).
.
Reach Length
Reach 3 is approximately ? miles in length.

Reach Drainage Infrastructure – Figure 2
The drainage infrastructure in Reach 3 includes culverts #881.

Reach Drainage Maintenance Activities
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Beaver Dam Removal
Beaver dams are removed as required.

Reach Habitat Conditions
The mature deciduous trees along the lower half of Reach 3, a distance of approximately .3 miles, completely canopy the channel. The channel is relatively free of reed canary grass as a result of the shade provided by the mature deciduous trees along the channel. Large woody debris elements are also present in the channel providing structure and complexity to the channel habitat. Silts and fines dominate the channel substrate. Given the limited riparian habitat upstream of this part of Reach 3, elevated water temperatures and reduced dissolved oxygen levels, especially during the summer, would be expected to limit the suitability of the habitat for juvenile rearing. Adult and juvenile migration is possible through this reach though restricted at times by low flow and poor water quality.

The channel in the upper half to Reach 3 has been modified and simplified via historic dredging and diking activities. The channel is confined by a dike along the left bank (south). The channel along the right bank is bordered by heavily grazed pasture. Large woody debris is absent in part of the reach. Silts and fines dominate the channel substrate. Given the absence of mature conifer and deciduous trees along this reach, elevated water temperatures and reduced dissolved oxygen levels, especially during the summer, would be expected to limit the suitability of the habitat for juvenile rearing. Adult and juvenile migration is possible through this reach though restricted at times by shallow water and poor water quality.

Riparian Characteristics
The lower half of Reach 3, a distance of approximately .3 miles, the riparian habitat on the right bank (north) and left bank (south) is dominated by mature deciduous trees. Black berry and reed canary grass are limited by the shade created by the mature deciduous trees

The upstream half of Reach 3, a distance of approximately .2 miles, the riparian habitat on the right bank (north) is dominated by reed canary grass. Heavily grazed pasture extends to the top of the channel bank. The riparian habitat on the left bank (south) adjacent to the dike is dominated by reed canary grass.

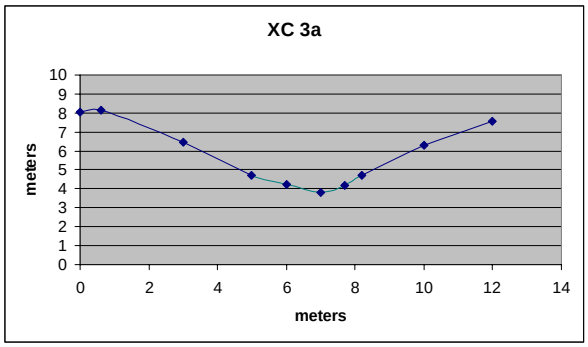
Riparian Habitat Observations Associated With Channel Cross Sections	
Channel Cross Section 3a	**Channel Cross Section 3b**
Has a relatively healthy riparian zone 1,200 ft in length (west half of reach 3) on both sides of the creek.	Runs through farmer's field, RC Grass and blackberry
Multiple adult deciduous trees along creek, a few conifers in the immediate area	

Fish Passage Barriers & Obstacles – Figure 4
According to WDFW's Salmonscape Database, there are no fish passage barriers or obstacles in Reach 3.

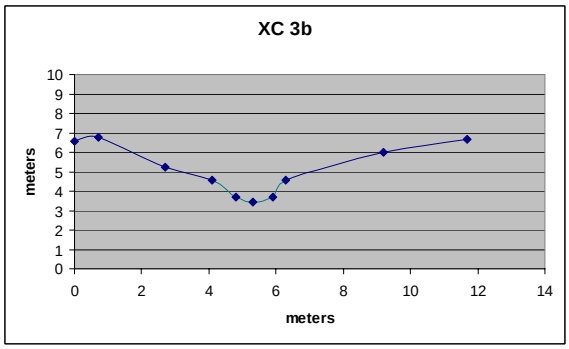
Spawning Habitat
Spawning habitat is not present in Reach 3.

Channel Cross Section

Lower Section



Upper Section



Reach Fish Utilization – Figure 4
Reach 3 is a migratory corridor for adult and juvenile salmon. Reach 3 provides winter rearing for juvenile salmon. The west half of Reach 3 may provide summer rearing given the presence of mature riparian canopy cover and the absence of reed canary grass. However, summer rearing in Reach 3 will be generally limited by low flow conditions and water quality constraints.

Reach Fish Habitat Improvement Opportunities – Figure 7

1. Riparian Habitat Enhancement: Livestock grazing could be pulled back from the channel and conifers and deciduous trees planted. The shade provided by the riparian plantings would improve water quality in the creek and help control reed canary grass. The channel could be maintained by the district as needed via the dike along the south side of the channel.

2. Riparian Habitat Enhancement: Salmon berry, willow, nooka rose and hardhack could be planted along the channel side of the dike to improve water quality in the creek and help control reed canary grass. These species can tolerate the disturbance necessary to access the creek with machinery to conduct periodic maintenance dredging.

Reach Photographs – Figure 8

REACH 4

Reach Description - Figure 6
Reach 4 begins where Thomas Creek makes a hard turn to the north (downstream of Kelleher Road) and extends upstream to where Thomas Creek turns back to the east (upstream of Kelleher Road).

Reach Length
Reach 4 is approximately ? miles in length.

Reach Drainage Infrastructure – Figure 2
The drainage infrastructure in Reach 4 includes culverts #886 and #887.

Reach Drainage Maintenance Activities
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Flood Gate Maintenance
Repair and replace flood gates as required.
Beaver Dam Removal
Beaver dams are removed as required.

Reach Habitat Conditions
The channel in Reach 4 has been modified and simplified via historic dredging and diking activities. The channel is confined by a dike along the left bank (southeast). The channel along the right bank (northwest) is bordered by Kelleher Road and a gravel mining operation. Large woody debris is absent in Reach 4. Silts and fines dominate the channel substrate. Elevated water temperatures and reduced dissolved oxygen levels, especially during the summer, would be expected to limit the suitability of the habitat for juvenile rearing. Adult and juvenile migration is possible through this reach though restricted at times by shallow water and poor water quality.

Riparian Characteristics
Mature deciduous trees are present along Thomas Creek at the south end of Reach 3 and along the right bank (northwest side) from immediately upstream of the Kelleher Road culverts (#886, #887) to the north end of the reach. The right bank downstream of Kelleher Road is confined by the road and is dominated by reed canary grass, blackberries, salmon berry and scattered willows. The left bank (southeast side) is confined by a dike and is dominated by reed canary grass.

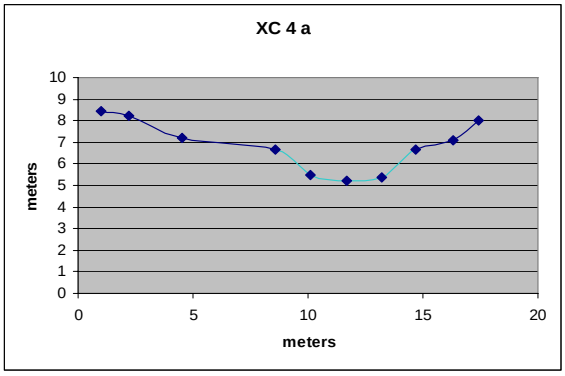
Riparian Habitat Observations Associated With Channel Cross Sections	
Channel Cross Section 4a	**Channel Cross Section 4b**
No trees, west bank dominated by RC grass and blackberry	Few individual trees, both sides dominated with blackberry
East bank, mix of salmonberry and Blackberry	and RC grass

Fish Passage Barriers & Obstacles – Figure 4
According to WDFW's Salmonscape Database, there are no fish passage barriers or obstacles in Reach 4.

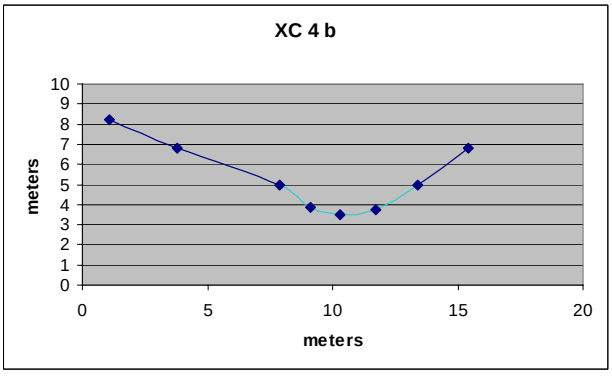
Spawning Habitat
Spawning habitat is not present in Reach 4.

Channel Cross Section

Lower Section



Upper Section



Reach Fish Utilization – Figure 4
Reach 4 is a migratory corridor for adult and juvenile salmon. Reach 4 provides winter rearing for juvenile salmon. Summer rearing is be limited by low flow conditions and water quality constraints.

Reach Fish Habitat Improvement Opportunities – Figure 7

1. Riparian Habitat Enhancement: The riparian habitat along the channel side of the dike to improve water quality in the creek and help control reed canary grass while maintaining equipment access to the channel.

2. The riparian habitat at the south end of the reach and along the right bank upstream of Kelleher Road could be enhanced with conifer trees.

3. The culverts under Kelleher Road appear to be undersized for flood flow conveyance. These culverts could be replaced with a bridge or single bottomless culvert that would better accommodate flood flows and fish passage.

Reach Photographs – Figure 8

REACH 5

Reach Description - Figure 6
Reach 5 begins where Thomas Creek turns back to the east (upstream of Kelleher Road) and extends upstream to where Thomas Creek crosses under the F&S Grade Road to the east at culvert #890).

Reach Length
Reach 5 is approximately ? miles in length.

Reach Drainage Infrastructure – Figure 2
The drainage infrastructure in Reach 5 includes culverts #889, #890, and #891.

Reach Drainage Maintenance Activities
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Beaver Dam Removal
Beaver dams are removed as required.

Reach Habitat Conditions

Reach 5 has been straightened and channelized. The majority of Reach 5 is confined by dikes along both sides. The eastern 1/3rd of Reach 5 is confined by a dike along the left bank and F&S Grade Road on the right bank. Large woody debris is absent in this reach. Silts and fines dominate the channel substrate. As noted below, the riparian habitat along the majority of this reach is dominated blackberry and reed canary grass. Elevated water temperatures and reduced dissolved oxygen levels, especially during the summer, would be expected to limit the suitability of the habitat for juvenile rearing. At approximately the mid point of Reach 5, two small streams enter Thomas Creek from the north. These 2 small streams may provide a source of cooler water thus potentially benefiting the water quality in Thomas Creek in the immediate vicinity of where these streams enter Thomas Creek. Improved water quality at these locations may provide juvenile salmon an enhanced summer rearing opportunity. Adult and juvenile migration is possible through this reach though it may be restricted at times by shallow water and poor water quality.

Riparian Characteristics

The majority of the riparian habitat along Reach 5 is dominated by blackberries and reed canary grass. There is a narrow band of mature deciduous trees along both the right and left banks of the eastern 1/3rd of Reach 3.

Riparian Habitat Observations Associated With Channel Cross Sections	
Channel Cross Section 5a	**Channel Cross Section 5b**
Few adult trees, both banks dominated by blackberry creek bed choked with RC grass	Numerous adult trees (primarily deciduous), native shrubs on north bank south bank dominated by Blackberry

Fish Passage Barriers & Obstacles – Figure 4

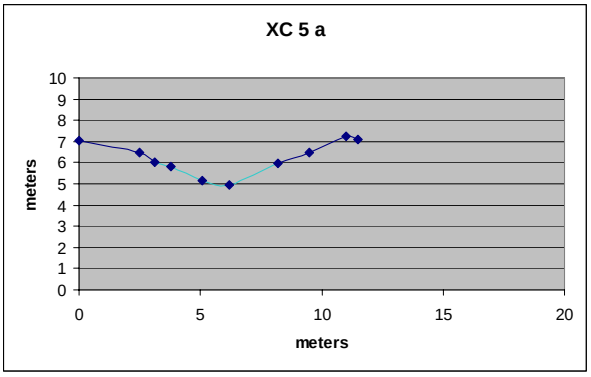
According to WDFW's Salmonscape Database, there are no fish passage barriers or obstacles in Reach 5. However, fish passage at culverts #889 and #891 is listed as unknown.

Spawning Habitat

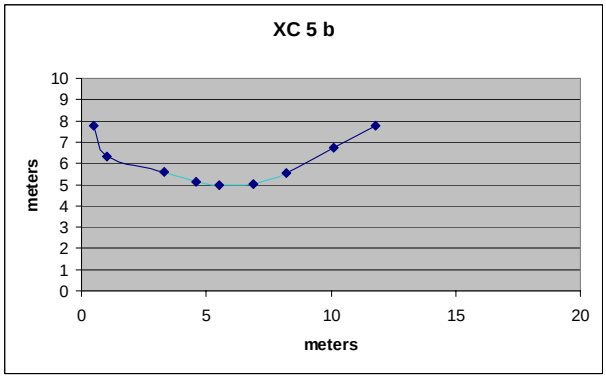
Spawning habitat is not present in Reach 5.

Channel Cross Section

Lower Section



Upper Section



Reach Fish Utilization – Figure 4

Reach 5 is a migratory corridor for adult and juvenile salmon. Reach 5 provides winter rearing for juvenile salmon. Summer rearing will be limited by low flow conditions and water quality constraints.

Reach Fish Habitat Improvement Opportunities – Figure 7

1. Riparian Habitat Enhancement: Salmon berry, willow, nooka rose and hardhack could be planted along the right bank (north side) to improve water quality in the creek and help control reed canary grass while maintaining equipment access to the creek. These species can tolerate the disturbance necessary to access the creek with machinery to conduct periodic maintenance dredging.

2. Riparian Habitat Enhancement: Conifers and deciduous trees could be planted along the left bank of the channel (south) in Reach 5 to improve water quality in Thomas Creek and to control reed canary grass and blackberries. Access would need to be secured to the right bank of the channel for the purpose of maintenance dredging.

3. Wetland and Side Channel Habitat Enhancement: Where small tributary streams enter Thomas Creek along the right bank immediately south of F&S Grade Road, it may be possible to enhance these areas to provide wetland and channel rearing habitats for juvenile salmon. Depending on the summer flow regimes of these tributary streams, the input of cooler water may provide an opportunity to create summer rearing habitat for juvenile salmon at the confluence of these tributary streams with Thomas Creek.

Reach Photographs – Figure 8

REACH 6

Reach Description - Figure 6
Reach 6 begins where Thomas Creek crosses under the F&S Grade Road to the east at culvert # 890 and extends upstream parallels the F&S Grade Road to where the southeast fork of Wollard Creek crosses under the F&S Grade Road at an unnumbered culvert immediately upstream of culvert #975.

Reach Length
Reach 3 is approximately ? miles in length.

Reach Drainage Infrastructure – Figure 2
The drainage infrastructure in Reach 6 includes culverts #890, #981, #974, #975, #976, and a unnumbered culvert at the southeast fork of Wollard Creek.

Reach Drainage Maintenance Activities
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Beaver Dam Removal
Beaver dams are removed as required.

Reach Habitat Conditions
Thomas Creek and Wollard Creek in Reach 6 are confined to a roadside ditch along the southwest side of the F&S Road. Large woody debris is not present in this reach. Silts and fines dominate the channel substrate. Elevated water temperatures and reduced dissolved oxygen levels, especially during the summer, would be expected to limit the suitability of the habitat for juvenile rearing. Adult and juvenile migration is possible through this reach though it may be restricted at times by shallow water and poor water quality.

Riparian Characteristics
The right bank of Reach 6 is confined by the F&S Grade road and is consequently dominated by blackberry and reed canary grass. The left bank is not confined by a dike though it is adjacent to residential housing and farmland. The left bank is dominated by reed canary grass and blackberry with a few scattered mature deciduous trees. Approximately 200 feet of the left bank has been planted with a narrow band of evergreen trees.

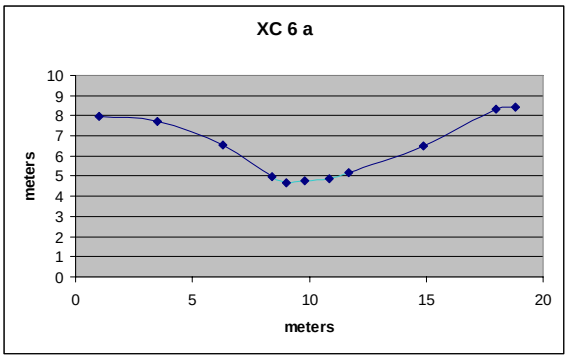
Riparian Habitat Observations Associated With Channel Cross Sections	
Channel Cross Section 6a	**Channel Cross Section 6b**
Few adult trees, both banks dominated by blackberry	Few adult trees, both banks covered with Blackberry and RC grass
Creek bed choked with RC grass	

Fish Passage Barriers & Obstacles – Figure 4
According to WDFW's Salmonscape Database, there are no fish passage barriers or obstacles in Reach 6. However, fish passage at culvert #981is unknown.

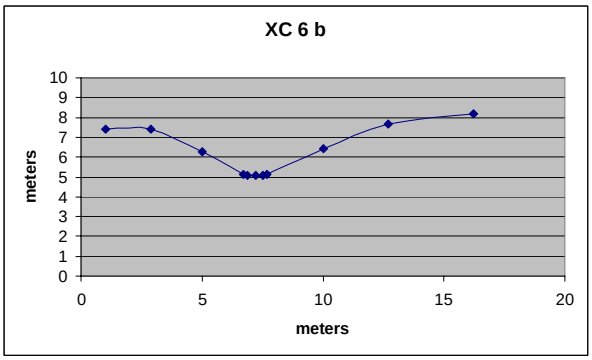
Spawning Habitat
Spawning habitat is not present in Reach 6.

Channel Cross Section

Lower Section



Upper Section



Reach Fish Utilization – Figure 4
Reach 6 is a migratory corridor for adult and juvenile salmon. Reach 6 provides winter rearing for juvenile salmon. Summer rearing will be limited by low flow conditions and water quality constraints.

Reach Fish Habitat Improvement Opportunities – Figure 7

1. Riparian plantings along the south side of the channel.

2. Move livestock grazing away from the channel and restrict livestock access to the channel.

3. Replace culvert 890 to improve upstream fish passage in Thomas Creek and improve flood flow conveyance.

4. Evaluate the sediment input into Thomas Creek immediately upstream of culvert #890.

5. Enhance the riparian habitat and channel complexity upstream of culvert #890.

6. Replace culvert #975 to improve upstream fish passage in Wollard Creek and improve flood flow conveyance.

Reach Photographs – Figure 8

B2. Horizontal Stream Gradient Profile

Stream bed elevations for that portion of Thomas Creek that are within the jurisdictional boundaries of DID#14 were measured by Azimuth Northwest, Inc. in 2005 and are presented in Figure 8.

B3. Watercourse Reach Prescriptions

The parties to this Drainage Maintenance Agreement, in consultation with SRSC, have cooperatively integrated their respective needs regarding agriculture drainage and fish habitat improvement through the development of "Reach Prescriptions" for the each of the three reaches associated with the Watercourse With Headwaters (green) with the boundaries of DID#14 that includes No Name Slough. The three "Reach Prescriptions" are presented here.

Reach 1 Prescription

Drainage Maintenance:

<u>Dredging</u>

DID#14 dredges high spots in this reach approximately every 5 years or as needed .

<u>Mowing</u>

DID #14 mows the channel banks in this reach every year.

Addendum B
Drainage Maintenance Plan
Drainage and Irrigation District #14

Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
The Old Highway 99 bridge is maintained by WDOT as needed.
The Green Road bridge is maintained by Skagit County as needed.
Beaver Dam Removal
Beaver dams are removed as required.

Drainage and Habitat Improvement:
Channel Modification:
The right bank (north) between Old Highway 99 and the Samish River is very steep. In addition, the dike along the north side of the channel is 45 feet wide. The right bank of the channel could be laid back and benched to provide additional bank stability, flood storage and improved fish habitat. The bench could be planted with salmon berry, hardhack and willow to discourage reed canary grass and shade the channel. Dike top access and the ability to access the channel with equipment for maintenance dredging could be retained.

Channel Modification:
The left bank (south) between Old Highway 99 and the Samish River is very steep. The right bank of the channel could be laid back and benched to provide additional bank stability, flood storage and improved fish habitat. The bench could be planted with salmon berry, hardhack and willow to discourage reed canary grass and shade the channel. Dike top access and the ability to access the channel with equipment for maintenance dredging could be retained. However, laying the right bank back would displace one row of small conifer trees associated with the a KREP riparian project.

Thomas Creek Flood Overflow Swale
A flood overflow swale could be constructed on the Nef Farm to confine the flood flows from Thomas Creek and effectively route the flood flows back to the Samish River. A flood overflow swale could reduce the area of the Nef Farm that is flooded and could reduce the risk of fish stranding in the fields when the flood flows recede. The flood overflow swale could be configured such that agriculture is maintained within the footprint of the flood overflow swale. DID #14 drainage would also benefit by a flood overflow swale.

Reach 2 Prescription

Drainage Maintenance:
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
The Green Road bridge is maintained by Skagit County as needed.
Flood Gate Maintenance
Repair and replace flood gates as required.
Beaver Dam Removal
Beaver dams are removed as required.

Drainage and Habitat Improvement:
Wetland and Side Channel Development: Approximately .5 miles upstream of Green Road, there is approximately 5-10 acres of reed canary dominated wetland along the right bank of Thomas Creek. This reed canary dominated wetland could be modified and enhanced to provide side channel rearing habitat, native wetland habitat, water quality benefits and riparian habitat. Maintenance of Thomas Creek could still be accomplished via the dike on the left bank (south side).

Wetland Reconnection: The Skagit Land Trust wetland east and adjacent to Green Road could be replumbed to allow fish access. The ponds and channels could be interconnected to provide valuable off channel rearing habitat for juvenile salmonids.

Reach 3 Prescription

Drainage Maintenance:
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.

Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Beaver Dam Removal
Beaver dams are removed as required.

Drainage and Habitat Improvement:
Riparian Habitat Enhancement:
Livestock grazing could be pulled back from the channel and conifers and deciduous trees planted. The shade provided by the riparian plantings would improve water quality in the creek and help control reed canary grass. The channel could be maintained by the district as needed via the dike along the south side of the channel.

Riparian Habitat Enhancement:
Salmon berry, willow, nooka rose and hardhack could be planted along the channel side of the dike to improve water quality in the creek and help control reed canary grass. These species can tolerate the disturbance necessary to access the creek with machinery to conduct periodic maintenance dredging.

Reach 4 Prescription

Drainage Maintenance:
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Flood Gate Maintenance
Repair and replace flood gates as required.
Beaver Dam Removal
Beaver dams are removed as required.

Addendum B
Drainage Maintenance Plan
Drainage and Irrigation District #14

Drainage and Habitat Improvement:
Riparian Habitat Enhancement:
Riparian Habitat Enhancement: The riparian habitat along the channel side of the dike to improve water quality in the creek and help control reed canary grass while maintaining equipment access to the channel.

Riparian Habitat Enhancement:
The riparian habitat at the south end of the reach and along the right bank upstream of Kelleher Road could be enhanced with conifer trees.

Culvert Replacement:
The culverts under Kelleher Road appear to be undersized for flood slow conveyance. These culverts could be replaced with a bridge or single bottomless culvert that would better accommodate flood flows and fish passage.

Reach 5 Prescription

Drainage Maintenance:
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Beaver Dam Removal
Beaver dams are removed as required.

Drainage and Habitat Improvement:
Riparian Habitat Enhancement:
Salmon berry, willow, nooka rose and hardhack could be planted along the right bank (north side) to improve water quality in the creek and help control reed canary grass while maintaining equipment access to the creek. These species can tolerate the disturbance necessary to access the creek with machinery to conduct periodic maintenance dredging.

Riparian Habitat Enhancement:
Conifers and deciduous trees could be planted along the left bank of the channel (south) in Reach 5 to improve water quality in Thomas Creek and to control reed canary grass and blackberries. Access would need to be secured to the right bank of the channel for the purpose of maintenance dredging.

Wetland and Side Channel Habitat Enhancement:
Where small tributary streams enter Thomas Creek along the right bank immediately south of F&S Grade Road, it may be possible to enhance these areas to provide wetland and channel rearing habitats for juvenile salmon. Depending on the summer flow regimes of these tributary streams, the input of cooler water may provide an opportunity to create summer rearing habitat for juvenile salmon at the confluence of these tributary streams with Thomas Creek.

Reach 6 Prescription

Drainage Maintenance:
Dredging
DID#14 dredges high spots in this reach approximately every 5 years or as needed .
Mowing
DID #14 mows the channel banks in this reach every year.
Culvert Maintenance
There are no culverts maintained by DID#14 in this reach.
Herbicide Spraying
DID#14 uses herbicides every year to control the channel vegetation in this reach.
Bridge Maintenance
There are no bridges in this reach.
Beaver Dam Removal
Beaver dams are removed as required.

Drainage and Habitat Improvement:
Riparian Habitat Enhancement:
Enhance the riparian plantings along the south side of the channel.

Riparian Habitat Enhancement:
Move livestock grazing away from the channel and restrict livestock access to the channel.

Culvert Replacement:
Replace culvert 890 to improve upstream fish passage in Thomas Creek and improve flood flow conveyance.

Sediment Management:
Evaluate the sediment input into Thomas Creek immediately upstream of culvert #890.

Riparian Habitat Enhancement:
Enhance the riparian habitat and channel complexity upstream of culvert #890.

Culvert Replacement:
Replace culvert #975 to improve upstream fish passage in Wollard Creek and improve flood flow conveyance.

B4. Drainage and Habitat Improvement Implementation Measures

Through mutual agreement between the parties to this Drainage Maintenance Agreement and in consultation with SRSC, DID #14 and WDFW commit to achieve the 5- year target goals as specified for each of the drainage and habitat improvement projects identified in the Watercourse Reach Prescriptions and described below. The six (6) projects listed below have been divided into 2 implementation phases; phase 1 projects are priority 1 projects that are targeted to be completed in a five (5) year window (2006-2010), and phase 2 projects are priority 2 projects that are targeted as opportunity projects for the initial 5-year window (2006-2010) and implementation requirements will be evaluated annually. Though it is the intent of the parties to work collaboratively for a period of 5 years to achieve the stated 5-year target goals, the parties acknowledge that in some circumstances the successful achievement of the identified target goals may depend of factors outside of the control of the parties. The parties will annually review the progress made towards implementing the phase 1 projects. The parties will also continue to discuss the potential for implementing the phase 2 projects. At the end of year 5, it is the intent of the parties to review the progress that has been made towards achieving the identified 5-year target goals and to determine whether sufficient commitment has been made by the parties to justify renewal of the Drainage Maintenance Agreement and General 5-year HPA.

1. Project Description: <u>Channel Modification – Phase 1 Project</u>

The right and left banks of the channel between Old Highway 99 and the Samish River are very steep. The right and left banks of the channel could be laid back and benched to provide additional bank stability, flood storage and improved fish habitat. The bench could be planted with salmon berry, hardhack and willow to discourage reed canary grass and shade the channel. The left bank (north) could be configured and planted to provide equipment access to the channel to conduct maintenance dredging as required.

5-Year Target Goals:

- Conduct a feasibility assessment.
- Develop a project design.

- Acquire all or part of the ownership of or easements to the land base necessary for project implementation.
- Implement the designed project.

Timeline for completion: 2006 to 2010

DID#14 Commitments

- Commits the time necessary to participate in a feasibility assessment and help develop a project design.
- Commits the time to work with WDFW and SRSC to seek outside funding to support a feasibility assessment and to develop a project design.
- Commits to work with WDFW and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with WDFW and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits the time to work with WDFW and SRSC to seek outside funding to implement the project.
- Commits the time to work with WDFW and SRSC to implement the project.

WDFW Commitments:

- Commits the time necessary to participate in a feasibility assessment and help develop a project design.
- Commits the time to work with DID #14 and SRSC to seek outside funding to support a feasibility assessment and to develop a project design.
- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits the time to work with DID #14 and SRSC to seek outside funding to implement the project.
- Commits to assist with project permitting.
- Commits the time to work with DID #14 and SRSC to implement the project.

SRSC Commitments:

- Commits the time necessary to participate in a feasibility assessment and help develop a project design.
- Commits the time to work with DID #14 and WDFW to seek outside funding to support a feasibility assessment and to develop a project design.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits the time to work with DID #14 and WDFW to seek outside funding to implement the project.
- Commits the time to work with DID #14 and WDFW to implement the project.

2. Project Description: <u>Thomas Creek Flood Overflow Swale</u> – Phase 2 Project

A flood overflow swale could be constructed on the Nef Farm to confine the flood flows from Thomas Creek and effectively route the flood flows back to the Samish River. A flood overflow swale could reduce the area of the Nef Farm that is flooded and could reduce the risk of fish stranding in the fields when the flood flows recede. The flood overflow swale could be configured such that agriculture is maintained within the footprint of the flood overflow swale. DID #14 drainage would also benefit by a flood overflow swale.

5-Year Target Goals:

- Conduct a feasibility assessment.
- Develop a project design.
- Acquire all or part of the ownership of or easements to the land base necessary for project implementation.
- Implement the designed project.

Timeline for evaluation: 2006 to 2010

DID#14 Commitments

- DDID #14 commits to support a feasibility assessment and the development of a project design. Part or all of the district's cost may be satisfied with funding secured by the district from a grant or third party.
- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.

- Commits to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to support the land acquisitions or easements necessary to implement the project.
- Commits the time to work with WDFW and SRSC to seek outside funding to implement the project.
- Commits the time to work with WDFW and SRSC to implement the project.

WDFW Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and SRSC to seek outside funding to implement the project.
- Commits to assist with project permitting.
- Commits the time to work with DID #14 and SRSC to implement the project.

SRSC Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and WDFW to seek outside funding to implement the project.
- Commits the time to work with DID #14 and WDFW to implement the project.

3. Project Description: <u>Wetland and Side Channel Development – Phase 1 Project</u>

Approximately .5 miles upstream of Green Road, there is approximately 5-10 acres of reed canary dominated wetland along the right bank of Thomas Creek. This reed canary dominated wetland could be modified and enhanced to provide side channel rearing habitat, native wetland habitat, water quality benefits and riparian habitat. Maintenance of Thomas Creek could still be accomplished via the dike on the left bank (south side).

5-Year Target Goals:

- Conduct a feasibility assessment.
- Develop a project design.
- Acquire all or part of the ownership of or easements to the land base necessary for project implementation.
- Implement the designed project.

Timeline for completion: 2006 to 2010

Addendum B
Drainage Maintenance Plan
Drainage and Irrigation District #14

DID#14 Commitments:

- DDID #14 commits to support a feasibility assessment and the development of a project design. Part or all of the district's cost may be satisfied with funding secured by the district from a grant or third party.
- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to support the land acquisitions or easements necessary to implement the project.
- Commits the time to work with WDFW and SRSC to seek outside funding to implement the project.
- Commits the time to work with WDFW and SRSC to implement the project.

WDFW Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and SRSC to seek outside funding to implement the project.
- Commits to assist with project permitting.
- Commits the time to work with DID #14 and SRSC to implement the project.

SRSC Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and WDFW to seek outside funding to implement the project.
- Commits the time to work with DID #14 and WDFW to implement the project.

4. Project Description: <u>Wetland Reconnection</u> – Phase 2 Project
The Skagit Land Trust wetland east and adjacent to Green Road could be re-plumbed to allow fish access. The ponds and channels could be interconnected to provide valuable off channel rearing habitat for juvenile salmonids.

5-Year Target Goals:

- Conduct a feasibility assessment.
- Develop project design.

- Acquire all or part of the ownership of or easements to the land base necessary for project implementation.
- Implement the designed project.

Timeline for evaluation: 2006 to 2010

DID#14 Commitments

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with WDFW and SRSC to seek outside funding to support a feasibility assessment and develop a project design.
- Commits to work with WDFW and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with WDFW and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits the time to work with WDFW and SRSC to seek outside funding to implement the project.
- Commits the time to work with WDFW and SRSC to implement the project.

WDFW Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and SRSC to seek outside funding to support a feasibility assessment and develop a project design.
- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits the time to work with DID #14 and SRSC to seek outside funding to implement the project.
- Commits to assist with project permitting.
- Commits the time to work with DID #14 and SRSC to implement the project.

SRSC Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and WDFW to seek outside funding to support a feasibility assessment and develop a project design.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits the time to work with DID #14 and WDFW to seek outside funding to implement the project.
- Commits the time to work with DID #14 and WDFW to implement the project.

5**. Project Description: Wetland and Side Channel Habitat Enhancement** – Phase 1 Project
Where small tributary streams enter Thomas Creek along the right bank immediately south of F&S Grade Road, it may be possible to enhance these areas to provide wetland and channel rearing habitats for juvenile salmon. Depending on the summer flow regimes of these tributary streams, the input of cooler water may provide an opportunity to create summer rearing habitat for juvenile salmon at the confluence of these tributary streams with Thomas Creek.

5-Year Target Goals:

- Conduct a feasibility assessment.
- Develop a project design.
- Acquire all or part of the ownership of or easements to the land base necessary for project implementation.
- Implement the designed project.

Timeline for completion: 2006 to 2010

DID#14 Commitments

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with WDFW and SRSC to seek outside funding to support a feasibility assessment and develop a project design.

- Commits to work with WDFW and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with WDFW and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits the time to work with WDFW and SRSC to seek outside funding to implement the project.
- Commits the time to work with WDFW and SRSC to implement the project.

WDFW Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and SRSC to seek outside funding to support a feasibility assessment and develop a project design.
- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits the time to work with DID #14 and SRSC to seek outside funding to implement the project.
- Commits to assist with project permitting.
- Commits the time to work with DID #14 and SRSC to implement the project.

SRSC Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and WDFW to seek outside funding to support a feasibility assessment and develop a project design.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.

- Commits the time to work with DID #14 and WDFW to seek outside funding to implement the project.
- Commits the time to work with DID #14 and WDFW to implement the project.

6. Project Description: <u>Riparian Habitat Enhancement – Phase 2 Project</u>

Conifers and deciduous trees could be planted along the left bank of the channel (south) in Reach 5 to improve water quality in Thomas Creek and to control reed canary grass and blackberries. Access would need to be secured to the right bank of the channel for the purpose of maintenance dredging.

5-Year Target Goals:

- Conduct a feasibility assessment.
- Develop a project design.
- Acquire all or part of the ownership of or easements to the land base necessary for project implementation.
- Implement the designed project.

Timeline for evaluation: 2006 to 2010

DID#14 Commitments

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with WDFW and SRSC to seek outside funding to support a feasibility assessment and develop a project design.
- Commits to work with WDFW and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with WDFW and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits the time to work with WDFW and SRSC to seek outside funding to implement the project.
- Commits the time to work with WDFW and SRSC to implement the project.

WDFW Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and SRSC to seek outside funding to support a feasibility assessment and develop a project design.

- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and SRSC to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits the time to work with DID #14 and SRSC to seek outside funding to implement the project.
- Commits to assist with project permitting.
- Commits the time to work with DID #14 and SRSC to implement the project.

SRSC Commitments:

- Commits the time necessary to participate in a feasibility assessment and to help develop a project design.
- Commits the time to work with DID #14 and WDFW to seek outside funding to support a feasibility assessment and develop a project design.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to secure the ownership of or easement to all or part of the easements to the land base necessary to implement the project.
- Commits to work with DID #14 and WDFW to contact the landowners within the project footprint for the purpose of securing the ownership of or easements to the land base necessary to implement the project.
- Commits the time to work with DID #14 and WDFW to seek outside funding to implement the project.
- Commits the time to work with DID #14 and WDFW to implement the project.

C. OTHER ASSESSMENTS WITHIN DID #14

1. House Bill 1418 Report: Tidegates and Intertidal Salmon Habitat in the Skagit Basin, Carol Smith and Ed Manary, 2004.
2. Skagit Chinook Recovery Plan, Skagit River System Cooperative and Washington Department of Fish and Wildlife, 2005.
3. Preliminary Assessment Of Historic Conditions Of The Skagit River In The Fir Island Area: Implications For Salmonid Habitat Restoration, Brian Collins, 1998.
4. Priority Fish and Wildlife Projects Identified by Washington Department of Fish and Wildlife within the Greater Skagit River Ecosystem Planning Area, WDFW, 2002.

5. Application Of The Skagit Watershed Council's Strategy: River Basin Analysis of the Skagit and Samish Basins, Skagit Watershed Council, 1999.
6. Skagit County Baseline Monitoring Project, 2001-2003.

D. BEST MANAGEMENT PRACTICES – DISTRICT UNIQUE CIRCUMSTANCES

D1. General

Artificial Watercourses

The drainage infrastructure and maintenance activities in the district's artificial watercourses are not unique or significantly different from the infrastructure and maintenance activities contemplated in the development of the Drainage Maintenance Agreement and the Best Management Practices (Addendum A). Therefore, for the above reasons and consistent with Part III (C) of the Drainage Maintenance Agreement for DID #14, the Best Management Practices identified in Addendum A of the Drainage Maintenance Agreement for *Artificial Watercourses* (yellow) will apply as written and with the follow modifications:

General BMP #1 – Equipment will be operated from the top of the channel bank with the exception that floating watercraft may be used on the watercourse to apply herbicides to the channel banks.

General BMP #5 – Dredged, excavated or mowed materials will be deposited landward of the top of the channel bank except where dredged or excavated materials are used to repair areas where the channel bank has slumped or failed.

General BMP #10 – All debris and deleterious material resulting from drainage maintenance activities will be removed from the watercourse and prevented from re-entering the channel. Deleterious material does not include vegetative materials such as grass, blackberry, shrub or tree cuttings.

Managed Watercourse Without Headwaters - **Joe Leary Slough**

Joe Leary Slough is a tributary to Padilla Bay. Though Joe Leary Slough has been classified as a *Managed Watercourse Without Headwaters* (magenta), it is important to note that it does not exactly conform to the definition of a *Managed Watercourse Without Headwaters* as specified in Part III (A) of the Drainage Maintenance Agreement. Unlike other watercourses in Skagit County that have been classified as a *Managed Watercourse Without Headwaters* (Wiley Slough, Dry Slough, Brown Slough, Hall Slough, Dodge Slough, Sullivan Slough), Joe Leary Slough includes two small higher gradient tributary watercourses that drain the northeast corner of Bayview Ridge. However, given the limited headwater area associated with these two small

higher gradient tributary watercourses, for the purpose of the Drainage Maintenance Plan for DID #14, Joe Leary Slough has been classified as a *Managed Watercourse Without Headwaters.* The drainage infrastructure and maintenance activities in Joe Leary Slough are not unique or significantly different from the infrastructure and maintenance activities contemplated in the development of the Drainage Maintenance Agreement and the Best Management Practices (Addendum A). Therefore, for the above reasons and consistent with Part III (C) of the Drainage Maintenance Agreement for DID #14, the Best Management Practices identified in Addendum A of the Drainage Maintenance Agreement for *Managed Watercourses Without Headwaters* (magenta) will apply as written and with the follow modifications:

General BMP #1 – Drainage maintenance activities shall only occur with the equipment operated from the top of the channel bank with the exception that floating watercraft may be used on the watercourse to apply herbicides to the channel banks.

General BMP #6 – Dredged, excavated or bucket mowed materials shall be deposited landward of the top of the channel bank except where dredged or excavated materials are used to repair areas where the channel bank has slumped or failed.

General BMP #12 – All debris and deleterious material resulting from drainage maintenance activities shall be removed from the watercourse and prevented from re-entering the channel. Deleterious material does not include vegetative materials such as grass, blackberry, shrub or tree cuttings.

***Managed Watercourses With Headwaters* - Thomas Creek/Wollard Creek**

Thomas Creek is a tributary to the Samish River. Wollard Creek is a tributary to Thomas Creek. Though Thomas Creek and Wollard Creek have been classified as a *Managed Watercourses With Headwaters* (green), it is important to note that they do not strictly conform to the definition of a *Managed Watercourse With Headwaters* or of a *Natural Watercourse* as specified in Part III (A) of the Drainage Maintenance Agreement. Unlike the other watercourses in Skagit County that have been classified as *Managed Watercourses With Headwaters* (Big Ditch, No Name Slough, Big Indian Slough) and the other watercourses that have been classified as *Natural Watercourses* (Skagit River, Samish River), Thomas Creek and Wollard Creek do not discharge directly to marine waters. In addition, the width and watershed area of Thomas Creek and Wollard Creek more closely approximates the other watercourse in Skagit County that have been classified as *Managed Watercourses With Headwaters.* Therefore, for the purpose of the Drainage Maintenance Plan for DID #14, Thomas Creek and Wollard Creek are classified as a *Managed Watercourses With Headwaters* (green). The drainage infrastructure and maintenance activities in the district's *Managed Watercourses With Headwaters* (green) are not unique or significantly different from the infrastructure and maintenance activities contemplated in the development of the Drainage Maintenance Agreement and the Best Management Practices

(Addendum A). Therefore, for the above reasons and consistent with Part III (C) of the Drainage Maintenance Agreement for DID #14, the Best Management Practices identified in Addendum A of the Drainage Maintenance Agreement for a *Managed Watercourse With Headwaters* (green) will apply as written and with the follow modifications:

General BMP #1 – Drainage maintenance activities shall only occur with the equipment operated from the top of the channel bank with the exception that floating watercraft may be used on the watercourse to apply herbicides to the channel banks.

General BMP #7 – Dredged, excavated or bucket mowed materials shall be deposited landward of the top of the channel bank except where dredged or excavated materials are used to repair areas where the channel bank has slumped or failed.

General BMP #13 – All debris and deleterious material resulting from drainage maintenance activities shall be removed from the watercourse and prevented from re-entering the channel. Deleterious material does not include vegetative materials such as grass, blackberry, shrub or tree cuttings.

D2. Beaver Dams

Best Management Practices (BMPs) for beaver dam management were not included with the BMPs in Addendum A of the Drainage Maintenance Agreement and are therefore included here as part of the Drainage Maintenance Plan. Consistent with Part III (D) of the Drainage Maintenance Agreement, the following beaver dam management BMPs will apply. The beaver dam management BMPs for the district's A*rtificial Watercourses* (yellow) will be voluntarily applied by the district. The following beaver dam management BMPs for the district's *Managed Watercourses With Headwaters* (green) and *Managed Watercourse Without Headwaters* (magenta) will be included in the district's 5-Year General Hydraulic Project Approval. Also, consistent with the intent of PART III (D) of the Drainage Maintenance Agreement, beaver dam management in the district's *Natural Watercourse* (Samish River) will require Individual Hydraulic Project Approvals as provided for in RCW 77.55.

Artificial Watercourses (yellow)

1. TIMING LIMITATIONS: When water is present in the channel, beaver dam removal/modifications below the waterline and within 300 feet of a confluence with a marine water body, natural watercourse or an managed watercourse with headwaters, the removal/modification of beaver a dam will only occur from August 1 through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. The general HPA provisions for Artificial Watercourses (Addendum A) will apply.

3. Work will only be conducted during low flow conditions.

4. Under no circumstances will explosives be used to remove the beaver dam.

5. The beaver dam will be removed or modified gradually to provide for a controlled, slow release of the impounded water.

6. Removal or modification of the beaver dam will be accomplished by hand, with hand tools, winches and/or motorized equipment.

7. The woody materials removed from the beaver dam will be deposited landward of the top of the channel bank.

8. A list of beaver dam removal/modification activities will be included in the district's annual Drainage Maintenance Activity Report as specified in Part III- (H) of the districts Drainage Maintenance Agreement.

Managed Watercourses Without Headwaters (magenta)

1. TIMING LIMITATIONS: When water is present in the channel, beaver dam removal or modification below the waterline and within 300 feet of a confluence with a marine water body, natural watercourse or an managed watercourse with headwaters, the removal or modification of a beaver dam shall only occur from August 1 through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. When water is present in the channel and the removal or modification of a beaver dam within 300 feet of a confluence with a marine water body, natural watercourse or an managed watercourse with headwaters out side of the above referenced August 1 through October 15 window is necessary, modifications to the provisions below may be required to adequately protect fish.

3. The general HPA Provisions for a Managed Watercourse Without Headwaters (Addendum A) shall apply.

4. Work shall only be conducted during low flow conditions.

5. Under no circumstances shall explosives be used to remove the beaver dam.

6. The beaver dam shall be removed or modified gradually to provide for a controlled, slow release of the impounded water.

7. Removal or modification of the beaver dam may be accomplished by hand, with hand tools, winches and/or motorized equipment.

8. Existing large woody material embedded in the channel bank or streambed shall be left undisturbed and intact.

9. The woody materials removed from the beaver dam shall be deposited landward of the top of the channel bank.

10. The removal of and damage to existing woody stem riparian vegetation within 200 feet of the channel shall be held to the absolute minimum necessary to remove the beaver dam.

11. Beaver dam removal activities within 300 feet of a confluence with a marine water body, natural watercourse or an managed watercourse with headwaters shall be included in the districts' annual Drainage Maintenance Activity Report as specified in Part III- (H) of the districts Drainage Maintenance Agreement. The district's annual record of beaver dam removal or modification activities shall include the following information for each beaver dam site: location, reason for removal/modification, removal/modification start date, removal/modification end date, method of removal/modification, removal/modification problems, future removal/modification recommendations, are beaver dams at the site a reoccurring problem, before and after photographs.

Managed Watercourses With Headwaters (green)

Consistent with Section III – (F) of the district's Drainage Maintenance Agreement, for purposes of implementing the Drainage Maintenance Agreement entered into between WDFW and a District, the goal and intent will be to offset direct and/or indirect impacts to fish and fish habitat by incorporating the following BMPs as conditions associated with a General HPA issued for beaver dam removal.

In those instances where, during the development of the district's Drainage Maintenance Plan, beaver dam removal activities are determined by the Parties, in consultation with SRSC, to warrant the need for additional measures to offset otherwise unavoidable impacts to fish and/or fish habitat, WDFW and the appropriate District's Commissioners will work collaboratively and cooperatively to identify and implement appropriate and acceptable Habitat Improvement Projects. The goals, objectives and obligations necessary to implement the mutually agreed upon habitat improvement projects will be clearly identified in each district's Drainage Maintenance Plan.

1. TIMING LIMITATIONS: When water is present in the channel, the removal or modification of a beaver dam shall only occur from August 1 through October 15 of any year for the protection of migrating juvenile and adult salmon.

2. When water is present in the channel and the removal or modification of a beaver dam out side of the above referenced August 1 through October 15 window is necessary, modifications to the provisions below may be required to adequately protect fish. Additional mitigation, beyond what is specified in the districts Drainage Maintenance Plan, may also be required.

3. A WDFW Area Habitat Biologist shall survey each beaver dam removal or modification site prior to the start of removal or modification activities. A district commissioner shall contact the Skagit County WDFW Area Habitat Biologist (AHB) prior to the start of removal or modification activities to arrange for a WDFW survey of the beaver dam site.

4. The general HPA Provisions for a Managed Watercourse With Headwaters (Addendum A) shall apply.

5. Work shall only be conducted during low stream flow conditions.

6. Under no circumstances shall explosives be used to remove the beaver dam.

7. The beaver dam shall be removed or modified gradually to provide for a controlled, slow release of the impounded water. Removal of the beaver dam shall not exceed 1 foot vertical elevation of the dam during a 24 hour period.

8. Removal or modification of the beaver dam shall primarily be accomplished by hand or with hand tools, such as shovels, rakes, pitch forks, chain saws, and pevees. Winches may be used to dislodge some of the beaver dam material, provided that the not more than 1 vertical foot of the dam is removed in a 24 hour period as specified above in provision 4.

9. Equipment may be used to remove the beaver dam provided that the not more than 1 vertical foot of the dam is removed in a 24 hour period as specified above in provision 4. Equipment shall only be operated from the top of the channel bank. Equipment shall not cross the channel.

10. Large wordy material 6 feet or longer and 4 inches or greater in diameter embedded in the channel bank or streambed shall be left undisturbed and intact.

11. As determined during the WDFW site survey specified in provision 3, large woody material 6 feet or longer and 4 inches or greater in diameter shall either be placed or anchored in the channel to provide stable, functional fish habitat or shall be set aside in a secure location for use in future habitat improvement projects.

12. The smaller limbs and woody materials removed from the beaver dam shall be deposited landward of the top of the channel bank.

13. The removal of and damage to existing woody stem riparian vegetation within 200 feet of the channel shall be held to the absolute minimum necessary to remove the beaver dam.

14. Existing woody stem riparian vegetation within 200 feet of the channel that is removed or damaged during removal of the beaver dam shall be replaced with native species during the spring or fall immediately following beaver dam removal.

15. For reoccurring or persistent beaver dams, the district shall work with WDFW to investigate the merits of installing a flexible leveler or beaver deceiver.

16. All beaver dam removal or modification activities shall be included in the district' annual Drainage Maintenance Activity Report as specified in Part III- (H) of the district's Drainage Maintenance Agreement. The district's annual record of beaver dam removal or modification activities shall include the following information for each beaver dam site: location, reason for removal/modification, date of site survey with WDFW, removal/modification start date, removal/modification end date, method of removal/modification, removal/modification problems, future removal/modification recommendations, are beaver dams at the site a reoccurring problem, before and after photographs.

17. An individual Hydraulic Project Approval shall be required for beaver dam removal or modification activities within the boundaries of the wetland creation/enhancement, estuary creation/enhancement, alluvial fan creation/enhancement and side channel creation/enhancement projects identified in the Drainage and Habitat Improvement Implementation Measures section (B3) of the district's Drainage Maintenance Plan.

D3. Pumps

The drainage infrastructure for DID #14 does not include a pump site.

E. HYDRAULIC PROJECT APPROVALS - COMPLIANCE

DID #14 is bound to comply with the provisions and conditions of any and all Hydraulic Project Approvals (HPA's) issued pursuant to this Agreement. Failure to do so can result in revocation of the General Hydraulic Project Approval (GHPA) and may result in other penalties as provided by law. In the event a General Five-Year HPA issued pursuant to this Agreement is revoked or rescinded, DID #14 will henceforth be required to secure a individual site and/or project specific HPA for each drainage maintenance activity that will occur below the ordinary high water line in

watercourses (other than those that are wholly artificial) within the legally established boundaries of the District. Unavoidable impacts to fish and fish habitat occurring as a result of these individually permitted activities will be mitigated on a case-by-case basis.